

Appl. No. 10/750,059
Amdt. dated Mar. 31, 2006
Reply to Office action of Feb. 14, 2006

Remarks/Arguments

Applicant thanks Examiner Le for his patient and careful examination of this application and for the clear explanation of the claim objections and rejections. In response to the Office Action of February 14, 2006, applicant amends this application as follows:

1. claims 6, 28, and 29 are amended so they properly depend from claim 1.
2. claim 1 is amended to add further limitation to distinguish from the Wu patent.
3. new claims 30-33 are inserted.

Applicant respectfully submits that for the reason presented below, this application is in allowable form and all pending claims distinguish from the cited references and stand patentable.

Claim 1

Claim 1 describes a interconnect structure that includes a substrate, conductive contact pad, a compliant layer, and an insulation mask. The conductive contact pad includes an inner portion and an outer portion. The outer portion completely surrounds the inner portion. The compliant layer is disposed under the contact pad, with an elastic modulus lower than that of the contact pad. The inner portion of the contact pad over the compliant layer is thinner than the outer portion not over the compliant layer. The insulation mask is disposed over the contact pad with an opening that exposes the inner portion of the contact pad.

The Wu patent

The Wu patent discloses a package with I/O pad redistribution. It has an element 68 and element 84, which the Office Action cites as anticipating the outer portion and the inner portion of the contact pad. It is clear, however, the element 68, being a metal stud over the I/O pad 54, and having a width

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equal that of the I/O pad 54, sits on one side of the element 84. Another metal stud connecting to another I/O pad, insulated from the first I/O pad, sits on the opposite side of the element 84. Therefore, it can not be said that the Wu package anticipates the claim limitation that the outer portion of the conductive contact pad completely surrounding the inner portion of the contact pad.

The Fjelstad patent

The Fjelstad patent discloses a semiconductor chip package with fan-in leads. The Office Action cites element 150 and element 110 as the inner and the outer portions of the contact pad. Element 110 is a chip contact typically aligned in a peripheral region of the chip¹, and element 150 is the seed layer under a fan-in lead. For the same reason presented in reference to the Wu patent, it can not be said that a chip contact element completely surrounds the fan-in lead attached to the chip contact.

Because both the Wu patent and the Fjelstad patent do not disclose a contact pad of which the outer portion completely surrounds the inner portion, neither patent anticipates claim 1 and claim 1 stands patentable over the Wu patent and the Fjelstad patent.

Claims 3, 4, 6, 8-11, 28, and 29

Claims 3, 4, 6, 8-11, 28, and 29 properly depend from patentable claim 1 and stand patentable at least by virtue of their dependence.

Claim 30

The newly inserted claim 30 describes a semiconductor device that includes a substrate, a conductive contact pad, and a compliant layer. The contact pad has an inner portion and an outer portion, each has a thickness; the inner portion is thinner than the outer portion. The inner portion is enclosed by the outer portion.

¹ See, US 6,211,572 B1, col. 5, ll. 44-46.

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The compliant layer has an elastic modulus lower than that of the contact pad. The compliant layer is disposed directly under the contact pad, covered by the inner portion of the contact pad and it contacts the outer portion of the contact pad.

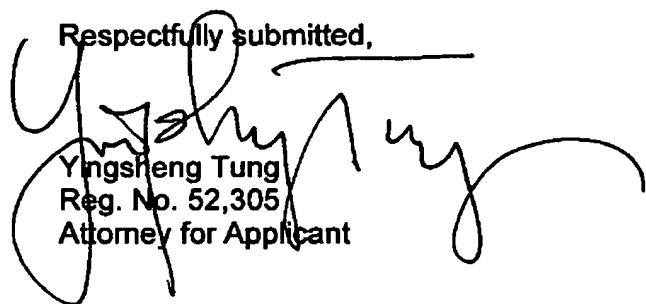
Claim 30 is fully supported by the original specification and the original drawing. It also distinguishes from the Wu patent and the Fjlestad patent and the references cited in the previous Office Actions. Applicant respectfully submits that claim 30 stands patentable over the cited references.

Claims 31-33

Claims 31-33 are also fully supported by the original specification and the original drawings. Combining with the base claim 30, they also distinguish from the references cited in the Office Actions and stand patentable.

Applicant respectfully submits that this application is in allowable form and all pending claims distinguish over the cited references in the Office Actions. Applicant respectfully requests further examination of this application and timely allowance of the pending claims.

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Respectfully submitted,

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